

## 4.5 NOISE

This section addresses noise issues related to the proposed project. The existing noise setting of the region and project site is described, and any sensitive receptors are identified. County policies related to noise are presented. The impact analysis presents the standards used to evaluate impacts to noise and addresses potential effects of the proposed project on the noise levels of the area.

### 4.5.1 SETTING

#### *INTRODUCTION*

Noise is defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) which is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Environmental noise is typically measured in A-weighted decibels (dBA). A dBA is a decibel corrected for the variation in frequency response of the typical human ear at commonly encountered noise levels. In general, A-weighting of environmental sound consists of evaluating all of the frequencies of a sound, taking into account the fact that human hearing is less sensitive at low frequencies and extremely high frequencies than in the frequency mid-range (much like a bell shaped curve). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. Representative noise sources and their corresponding A-weighted noise levels are shown in **Figure 4.5-1**.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound.

Environmental noise within an urbanized area typically fluctuates over time. This time-varying characteristic of environmental noise is described using statistical noise descriptors. An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. However, community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. What makes community noise constantly variable throughout a day is the addition of short duration single event noise sources such as aircraft flyovers, vehicle passbys, sirens, or similar sources, all of which are readily identifiable to the individual. These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts.

Figure 4.5-1

This time-varying characteristic of environmental noise is described using statistical noise descriptors. Descriptors used include  $L_{eq}$  and  $L_{dn}$ . The  $L_{eq}$  is the average A-weighted noise level that, during a stated time period, generates the same total acoustical energy as the time varying noise. The  $L_{dn}$  is a 24-hour day and night noise measurement that accounts for the greater sensitivity of most people to nighttime noise by weighting or “penalizing” noise levels at night. Noise between 10:00 p.m. and 7:00 a.m. is weighted by adding 10 dBA to take into account the greater annoyance of nighttime noises. In addition to the  $L_{dn}$ , the Community Noise Equivalent Level (CNEL) adds a 5 dBA “penalty” for the evening hours between 7:00 p.m. and 10:00 p.m. The statistical noise descriptors  $L_{50}$  and  $L_{max}$  are often used in noise policies and regulations in order to set limits on environmental noise. The  $L_{50}$  is the A-weighted noise level that is equaled or exceeded 50 percent of the stated time period. The  $L_{max}$  is an A-weighted maximum noise level for a given period of time and is not an average noise level such as  $L_{eq}$ ,  $L_{dn}$ , or CNEL. Other statistical noise descriptors exist; however, the noise descriptors used in this assessment are summarized below:

- $L_{eq}$ : The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The  $L_{eq}$  is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
- $L_{dn}$ : The 24-hour day and night A-weighted noise exposure level that accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night (“penalizing” nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.
- CNEL: Similar to the  $L_{dn}$ , the Community Noise Equivalent Level (CNEL) adds a 5 dBA “penalty” for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10 dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

### ***EFFECTS OF NOISE ON PEOPLE***

The effects of noise on people fall into three categories:

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting human reaction to a new noise environment is the way the new environment compares to the environment in which one is adapted, i.e., the so called "ambient noise"

level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise levels, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of one dBA cannot be perceived;
- Outside of the laboratory, a three dBA change is considered a just-perceivable difference;
- A change in level of at least five dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness and can cause adverse response.

Stationary point sources of noise, including stationary mobile sources, such as idling vehicles, attenuate (lessen) at a rate of six to nine dBA per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate, approximately four to six dBA.

### ***EXISTING NOISE LEVELS AND SOURCES***

The Sunset Industrial area is primarily open space and undeveloped. However, several significant sources of noise exist in the area, and create substantial background noise. Industrial facilities surrounding the project site generate noise from normal operations. In particular, signal horns can be heard regularly from the Rio Bravo power plant southeast of the project site. The Union Pacific Railroad generates substantial noise from train whistles, railroad crossing alarms, and track noise during regular passages of rail traffic. Noise from vehicular traffic is significant, and consists of several sources: refuse hauling trucks going to and from the county landfill creates regular noise along Athens Avenue and Industrial Boulevard; vehicular traffic on State Route 65 contributes noise; and vehicular noise is generated from patrons and staff of the Thunder Valley Casino along primary roadways.

During previous environmental assessments of the project area and the casino, 24-hour day-night noise measurements were measured at two locations. **Table 4.5-1** summarizes 24-hour noise data for locations equivalent to the nearest existing residence which is situated 9,000 feet north of the Thunder Valley Casino, and a location 4,000 feet south of the Thunder Valley Casino near Cincinnati Avenue. With all these sources incorporated, ambient day-night noise levels at the Thunder Valley Casino site is estimated to be 60 dBA,  $L_{dn}$ ,  $\pm 1.5$  dBA. No other sensitive receptors exist or are proposed in the vicinity of the proposed road.

**TABLE 4.5-1  
LONG-TERM NOISE MONITORING (dBA)**

<b>Statistical Descriptor</b>	<b>Industrial Area</b>	<b>Nearest Residence</b>
L <sub>eq</sub> Nighttime 10:00 p.m. - 7:00 a.m. (not penalized)	52	51
L <sub>eq</sub> Daytime 7:00 a.m. -10:00 p.m.	50	51
L <sub>eq</sub> 24-Hour	51	51
L <sub>dn</sub> 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.	58	57
CNEL 5 dBA penalty for noise between 7:00 p.m. and 10:00 p.m. and 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.	58	58

Source: Environmental Science Associates, 1997.

### ***SENSITIVE LAND USES***

Some land uses are considered more sensitive to ambient noise levels than others; sensitivity being a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. Residential land uses are generally more sensitive to noise than commercial and industrial land uses.

The nearest existing residence to the proposed road is a small ranch home located approximately 2 miles to the north. Because the project site is located in the Sunset Industrial Area, Placer County has afforded such development special noise provisions and protections from encroaching noise-sensitive development.

### ***NOISE REGULATIONS, PLANS, AND POLICIES***

#### ***Placer County General Plan Noise Element***

Placer County's policies and guidelines towards noise are contained in the General Plan's Noise Element. The Placer County General Plan establishes noise exposure standards for different land uses. For impacts to residential land uses, the normally acceptable exterior noise level is 50 dBA, L<sub>dn</sub> or less as measured at the property line of the receiving land use. If the proposed residential land use is to be located adjacent to an industrial land use, the normally acceptable exterior noise level would be 60 dBA, L<sub>dn</sub>. For office buildings/business and commercial land uses, the normally acceptable exterior noise level is 70 dBA, L<sub>dn</sub> or less. In instances where attainment of the noise performance standards is not possible with best available noise reduction measures, the Placer County General Plan allows an exterior noise level exceeding the acceptable L<sub>dn</sub>, provided that noise level reduction measures have been implemented and that certain interior noise levels are achieved. The County's noise exposure standards for various land uses are shown in **Table 4.5-2** (Placer County 1994).

**TABLE 4.5-2**  
**PLACER COUNTY NON-TRANSPORTATIONAL AND TRANSPORTATIONAL**  
**NOISE PERFORMANCE STANDARDS**

<b>Zone District/Land Use<sup>a</sup></b>	<b>Non-Transportational Noise Sources Exterior/Interior (Ldn, dB)</b>	<b>Transportational Noise Sources Exterior/Interior (Ldn/CNEL, dB)</b>
Residential Adjacent Industrial	60/45	--
Other Residential <sup>b</sup>	50/45	60/45
Office/Professional	70/45	na/45 <sup>c</sup>
Transient Lodging	65/45	60/45
Hospitals, Nursing Homes	--	60/45
Theaters, Auditoriums, Music Halls	--	na/35 <sup>c</sup>
Churches, Meeting Halls	--	60/40 <sup>c</sup>
Schools, Libraries, Museums	--	na/45 <sup>c</sup>
Playgrounds, Neighborhood Parks	--	70/na
Neighborhood Commercial	70/45	--
General Commercial	70/45	--
Heavy Commercial	75/45	--
Limited Industrial	75/45	--
Highway Service	75/45	--
Shopping Center	70/45	--
Industrial	na/45	--
Industrial Park	75/45	--

na none applied

/a/ Zone District applies to receptors affected by non-transportational noise sources.

/b/ Exterior noise standards for single family residences located in agricultural zone districts may be subject to 70 Ldn, dB.

/c/ Interior noise standard is measured as a worst case one hour Leq, dB, rather than an Ldn/CNEL.

Source: Tables 9-1, 9-3 of Placer County General Plan, 1994. *Noise levels are A-weighted.*

The Placer County General Plan also contains specific policies governing noise sources and receptors. The following policies directly relate to the implementation of the project and are intended to regulate noise sources:

**Policy 9.A.2:** The County shall require that noise created by new non-transportation noise sources be mitigated so as not to exceed the noise level standards of Table 9-1 (**Table 4.5-2**) as measured immediately within the property line of noise sensitive land uses.

**Policy 9.A.3:** The County shall continue to enforce the *State Noise Insulation Standards* (California Code of Regulations, Title 24) and Chapter 35 of the *Uniform Building Code*.

**Policy 9.A.5:** Where proposed non-residential land uses will produce noise levels exceeding the

performance standards of Table 9-1 (**Table 4.5-2**) at existing or planned noise-sensitive uses, the County shall require submission of an acoustical analysis as part of the environmental review process so that noise mitigation may be included in the project design.

**Policy 9.A.6:** The feasibility of proposed projects with respect to future transportation noise levels shall be evaluated by comparison to Table 9-1 (**Table 4.5-2**).

**Policy 9.A.9:** Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 9-3 (**Table 4.5-2**) at outdoor activity areas or interior spaces of existing noise-sensitive land uses.

**Policy 9.A.11:** The County shall implement one or more of the following mitigation measures where existing noise levels significantly impact existing noise-sensitive land uses, or where the cumulative increase in noise levels resulting from new development significantly impacts noise sensitive land uses:

- a. rerouting traffic onto streets that have available traffic capacity and that do not adjoin noise-sensitive land uses;
- b. lowering speed limits, if feasible and practical;
- c. programs to pay for noise mitigation such as low cost loans to owners of noise-impacted property or establishment of developer fees;
- d. acoustical treatment of buildings; or
- e. construction of noise barriers.

**Policy 9.A.12:** Where noise mitigation measures are required to achieve the standards of Tables 9-1 and 9-3 (**Table 4.5-2**), the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.

A listing of all policies along with detailed descriptions of each policy can be found in the Placer County General Plan.

In addition to these noise policies intended to protect noise-sensitive land uses, the Placer County General Plan lists noise policies specifically directed to industrial land uses and the retention of those industrial land uses within the County (Policies under Goal 9.B). These special concessions granted to industrial land uses allows for the benefit of the doubt to be afforded to the industrial use whenever noise exposure standards listed in **Table 4.5-2** fall subject to interpretation (Policy 9.B.4).

#### ***Project Consistency with the Placer County General Plan***

The proposed project is consistent with the Placer County General Plan. The proposed project does not propose to violate the noise standards set forth for Industrial Park uses, nor is it anticipated to create noise levels that would violate the noise standards of surrounding or distant land uses.

## 4.5.2 IMPACTS AND MITIGATION MEASURES

### *SIGNIFICANCE CRITERIA*

Potential noise impacts include construction related noise and transportation related noise. Assessment of transportation related noise impacts used the Federal Highway Administrations Noise Prediction Model, after being adjusted to use California vehicle noise emission factors. Modeling parameters were evaluated similarly through all traffic scenarios for consistency. Non-transportation related noise impacts use collected noise data and/or industry averages. Average noise propagation and attenuation rates applicable to a relatively “soft” site (e.g., 6 dB for spherical dissipation) were assumed.

A noise impact will be considered significant if ambient noise is increased greater than 5 dBA as a consequence of proposed project implementation, or if existing or future planned residential land uses will be exposed to noise levels greater than Placer County’s noise goals.

### **Impact**

#### **4.5.1 Construction noise can create significant temporary noise impacts to sensitive receptors such as residential uses. The closest sensitive receptor to the construction site is approximately two miles to the north. This is a less than significant impact.**

Typical construction noise levels are shown in **Table 4.5-3**. **Table 4.5-4** shows the noise levels from construction equipment. Although construction activity can generate substantial levels of noise, the nearest sensitive receptor located to the north would not experience a significant increase in ambient noise level as a consequence. Assuming normal spherical dissipation of an 89 dBA,  $L_{eq}$ , construction phase noise as measured at a reference distance of 50 feet, the attenuated noise would be equivalent to 43.9 dBA,  $L_{eq}$  when heard at the nearest residence. This would not result in a significant increase in ambient noise level at this residence.

Because industrial land uses are considered relatively insensitive to intrusive noise, and because construction will not require unusual or abnormally loud activities such as blasting, no impacts would occur with respect to surrounding industrial land uses.

### **Mitigation Measure**

No mitigation is required.



**TABLE 4.5-3  
TYPICAL CONSTRUCTION NOISE LEVELS**

Construction Phase	Noise Level (dBA, $L_{eq}$ ) <sup>a</sup>
Ground Clearing	84
Excavation	89
Foundations	78
Erection	87
Finishing	89

a Average noise levels 50 feet from the noisiest source and 200 feet from the rest of the equipment associated with a given construction phase. Noise levels correspond to public works projects, road, sewer, and trench construction.

Source: Bolt, Beranek, and Newman, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, 1971.

**TABLE 4.5-4  
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT**

Construction Equipment	Noise Level (dBA, $L_{eq}$ at 50 feet)
Dump Truck	88
Portable Air Compressor	81
Grader	85
Scraper	89
Dozer	85
Paver	89
Generator	81
Backhoe	80

Source: Federal Transit Administration, 1995.

## Impact

### 4.5.2 Construction of the Sunset-Athens Connector Road would reroute some existing vehicular traffic from Industrial Avenue. Noise generated from this rerouted traffic could create significant impacts to sensitive receptors.

The Sunset Plan EIR identified increased noise from vehicle traffic as a cumulatively significant impact of development of the Sunset Industrial Area. An analysis was conducted for the proposed project, as described below, to determine its contribution to this cumulative impact. **Tables 4.5-5** summarizes existing plus project roadway noise reference levels. This reference level is compared to noise parameters for existing without project conditions, and the net change resulting from the proposed project's traffic contribution is noted.

Under the existing plus project scenario the proposed project does not result in a significant change to roadside traffic noise. A net increase of 2.1 dBA peak-hour  $L_{eq}$  would occur along Fiddymment Road between Athens and Blue Oaks Boulevard under the existing plus project scenario. A change of this magnitude is not considered significant, and no significant response is anticipated. Furthermore, surrounding land uses are primarily agricultural and proposed industrial, both of which are generally insensitive to obtrusive noise. In areas of existing or proposed residential land uses, net change in roadway noise as a result of the proposed project

operation does not exceed 1.6 dBA peak-hour  $L_{eq}$  under the existing scenario. An increase in ambient noise of this magnitude is barely perceptible. Construction of the project would not add to cumulative noise impacts because it is temporary. The project would have a less than significant impact.

### Mitigation Measure

None required.

**TABLE 4.5-5  
EXISTING NOISE LEVELS WITH AND WITHOUT PROPOSED PROJECT (dBA)**

Roadway Segment	Reference Noise Level <sup>a</sup>		
	Existing Without Project	Existing Plus Project	Net Difference
<b><i>Fiddymont Road</i></b>			
Athens to Blue Oak	63.0	65.1	+ 2.1
Blue Oak to Baseline	65.9	67.5	+ 1.6
<b><i>Blue Oak Boulevard</i></b>			
Fiddymont to Foothills	64.5	65.0	+ 0.5
<b><i>Foothills Boulevard</i></b>			
Blue Oak to Pleasant Grove	71.4	71.5	+ 0.1
Pleasant Grove to Baseline	73.0	73.1	+ 0.1
<b><i>Baseline Road</i></b>			
Fiddymont to Foothills	69.4	69.4	0
<b><i>Sunset Boulevard</i></b>			
State Route 65 to Atherton	68.4	68.6	+ 0.2
Atherton to Stanford Ranch	67.4	67.5	+ 0.1
<b><i>State Route 65</i></b>			
Sunset to Sterling	76.9	78.0	+ 1.1
Sterling Westlake	77.7	77.9	+ 0.2
Sunset to Washington	78.3	79.8	+ 1.5

<sup>a</sup> Reference noise level is noise level 50 feet from center of roadway segment.  
Source: ESA, 1997.